

Claims

1. Method for spraying an aqueous liquid into the air intake duct (2) of a turbocharged piston engine (1) for humidifying the intake air to reduce nitrogen oxide emissions, characterized in that, in a first stage in the method, the intake air is heated by a heat exchanger element (5') before the turbocharger and water mist is injected into the air intake duct after the first heating stage through at least one first nozzle (9, 10), that in a second stage the intake air is compressed by the turbocharger (4), causing its temperature to rise, and water mist is injected into the air intake duct through at least one second nozzle (12, 13) after the second stage.
2. Method according to claim 1, characterized in that the amount of water supplied by the nozzles is adjusted according to the load and/or speed of rotation of the engine.
3. Spraying apparatus for humidifying the intake air of a turbocharged piston engine (1) to reduce nitrogen oxide emissions, said apparatus comprising at least one nozzle for spraying an aqueous liquid into the air intake duct (2), characterized in that the apparatus comprises at least one heating element (5') for heating the intake air before the turbocharger (4) and at least one first nozzle (9, 10) for spraying an aqueous liquid mist into the air intake duct after the heating element (5').
4. Spraying apparatus according to claim 3, characterized in that the apparatus comprises at least one second nozzle (12, 13) for spraying an aqueous liquid mist into the air intake duct (2) after the turbocharger (4).
5. Spraying apparatus according to claim 3 or 4, characterized in that the apparatus comprises valve elements (13, 14) used to control and/or to open/close the liquid flow passage leading to the nozzles (9 – 13).

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6. Spraying apparatus according to any one of claims 3 – 5, characterized in that at least one first intake air heating element (5') is a heat exchanger element.
- 5 7. Spraying apparatus according to any one of claims 3 – 6, characterized in that at least one second device heating the intake air is an intake air compressor (4).
- 10 8. Spraying apparatus according to any one of claims 3 – 7, characterized in that the apparatus comprises control equipment by means of which the spraying action of at least some of the nozzles (9 – 12) can be controlled.
- 15 9. Spraying apparatus according to any one of claims 3 – 8, characterized in that the droplet size of the liquid mist is usually below 200 micrometers.
- 20 10. Spraying apparatus according to any one of claims 3 – 9, characterized in that the pressure in the liquid supply piping is 10 – 300 bar.